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THE COUNCIL FOR TOBACCO RESEARCH - U.S.A., INC.

110 EAST 50TH STREET  
NEW YORK, N. Y. 10022  
(212) 421-8885

Application for Research Grant

Date: June 23, 1975

(Use extra pages as needed)

1. Principal Investigator (give title and degrees):

Carlos W. M. Bedrossian, M.D.

Assistant Professor of Pathology, University of Texas Medical School at Houston,  
Assistant Pathologist and Director of Cytopathology, Hermann Hospital,  
Houston, Texas.

2. Institution & address:

The University of Texas Health Science  
Center at Houston (Medical School)

P. O. Box 20036

Houston, Texas 77025

3. Department(s) where research will be done or collaboration provided:

Pathology Department

4. Short title of study:

Relationship Between Pulmonary Emphysema and Liver Cirrhosis on the Basis  
of an Acquired Deficiency of Alpha-1-Antitrypsin

5. Proposed starting date: January 1, 1976

6. Estimated time to complete: Two years

7. Brief description of specific research aims:

The purpose of this investigation is to determine the incidence and pattern  
of the emphysema present in association with advanced cirrhosis of the  
liver in an autopsy population of smoking and non-smoking alcoholics.  
This approach will be a continuation of our interest in studying the  
background factors and determining the relationship of emphysema to other  
conditions as we have previously done with heart disease<sup>1</sup>, systemic hyper-  
tension<sup>2</sup> and bronchogenic carcinoma<sup>3</sup>.

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8. Brief statement of working hypothesis:

The reason to investigate the relationship between emphysema and cirrhosis is based on the hypothesis that the latter will result in an acquired deficiency of alpha-1-antitrypsin (A<sub>1</sub>AT). As it is known, the liver is the site of production of A<sub>1</sub>AT believed to be the principal inhibitor of the proteases<sup>4</sup>. Congenital deficiency of this enzyme was first associated with emphysema appearing in young persons<sup>5</sup>. Subsequently, lack of A<sub>1</sub>AT has been linked to the development of cirrhosis in children<sup>6</sup>. More recently, either emphysema<sup>7</sup> or cirrhosis<sup>8</sup>, or both<sup>9</sup>, have been reported in adults and elderly patients with A<sub>1</sub>AT deficiency. In most instances, it has been postulated that the basic defect is the enzyme deficiency, whereas the disease processes represent secondary manifestations<sup>10,11</sup>. However, the possibility of the cirrhosis being the primary defect with subsequent appearance of the enzyme deficiency and resulting emphysema has never been explored. The purpose of our study is to test this hypothesis by initially determining the extent of the association between cirrhosis and emphysema.

9. Details of experimental design and procedures (append extra pages as necessary)

Lungs from consecutive autopsies of patients with cirrhosis will be included in the study. After careful removal, inflation and fixation will be accomplished with formaldehyde vapor by means of a modified Weibel's apparatus<sup>12</sup>.

Low intensity roentgenograms will be performed on high contrast industrial films in a Faxitron machine after which tantalum bronchograms will be performed. Lungs will then be cut parasagittally at 2 cm. intervals with an electric knife. Sections will be examined with a zoom stereoscopic dissection microscope and interesting areas will be photographed.

In the sections of inflated specimens it will be possible to classify emphysema anatomically as centrilobular, panlobular, paraseptal, and irregular, according to the criteria of the American Thoracic Society<sup>13</sup>. A detailed assessment of each lung will determine certain parameters of the emphysema present such as distribution of the process within the lung, localization of the lesions within the secondary lobules and degree of pulmonary involvement.

Hepatic cirrhosis will be studied pathologically in the same autopsied patients by gross and histopathological techniques to include H and E and other stains such as Masson's trichrome, P.A.S., Snook's reticulin and others. Cirrhosis of the liver will be classified according to the criteria set forth by Rubin and Popper as: regular, mainly monolobular cirrhosis (Laennec's or nutritional cirrhosis) and irregular, mainly multilobular cirrhosis (postnecrotic or posthepatic cirrhosis)<sup>17</sup>. The incidence of emphysema among all cirrhotic patients in general and the specific types of cirrhosis will then be statistically determined. Correlation will be made between the different types and degrees of emphysema associated with the various types of liver cirrhosis taking into account the smoking habits of the patients. Special attention will be paid to comparing the various specimen x-rays with the in vivo chest roentgenograms in an attempt to determine if the emphysema present could be diagnosed radiographically. In vivo and postmortem serum trypsin inhibitory capacity (S.T.I.C.) will be determined according to Hammarsten in the same patients whose lungs and liver are included in the study<sup>15</sup>. The S.T.I.C. values will then be correlated with the respective degrees of emphysema and cirrhosis. In addition, all sera will be phenotyped as to the exact level of A<sub>1</sub>AT.

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## 10. Space and facilities available (when elsewhere than item 2 indicates, state location):

For the study of lung and liver tissues the project will have the support of the Histopathology Laboratory of the Pathology Service at Hermann Hospital. For the special study of inflated and fixed lung specimens floor space will be made available in the Department of Pathology of the University of Texas Medical School at Houston, Texas. Facilities will also be provided by the Department of Pathology for the study of the in vivo chest roentgenograms and the various specimen Xrays. Serum trypsin inhibitory capacity determinations will be done at the Clinical Pathology Laboratory of Hermann Hospital.

Dr. Warren C. Miller and Dr. Donald C. Cannon are co-investigators in the project. Dr. Warren C. Miller will cooperate with us in identifying patients to enter the study. Dr. Donald C. Cannon will cooperate with us in determination of serum trypsin inhibitory capacity and phenotyping of the sera.

## 11. Additional facilities required:

The proposed program does not require collaboration with other institutions. Nevertheless, potential cooperation is available from the institutions where the principal investigator has previously been trained. Specifically, a large series of emphysematous lungs studied by the whole organ section technique is available to us at a Research Center in Florida. The incidence and patterns of cirrhosis could easily be determined among these emphysematous cases.

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## 12. Biographical sketches of investigator(s) and other professional personnel (append):

## 13. Publications: (five most recent and pertinent of investigator(s); append list, and provide reprints if available).

14. First year budget:

A. Salaries (give names or state "to be recruited")

Professional (give % time of investigator(s)  
even if no salary requested)

% time

Amount

Technical (To be Recruited)

100%

\$9,000.00

Sub-Total for A 9,000.00

B. Consumable supplies (by major categories)

1. Xray films \$800.00
2. Miscellaneous glassware 200.00
3. Reagents and chemicals 600.00

Sub-Total for B 1,600.00

C. Other expenses (itemize)

1. Analytic testing by Clinical Laboratory \$500.00

Sub-Total for C 500.00

\$11,100.00

Running Total of A + B + C

D. Permanent equipment (itemize)

1. Specimen Inflating apparatus \$1,000.00
2. Base-sledge whole organ microtome 5,000.00
3. Faxitron specimen Xray machine 1,000.00
4. Stereozoom dissecting microscope 900.00

Sub-Total for D 7,900.00

E

1,665.00

Total request \$20,665.00

E. Indirect costs (15% of A+B+C)

15. Estimated future requirements:

	Salaries	Consumable Suppl.	Other Expenses	Permanent Equip.	Indirect Costs	Total
Year 2	\$10,000	\$2,500	\$2,500		\$2,250	\$17,250
Year 3						

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## 16. Other sources of financial support:

List financial support from all sources, including own institution, for this and related research projects.

## CURRENTLY ACTIVE

Title of Project	Source (give grant numbers)	Amount	Inclusive Dates

## PENDING OR PLANNED

Title of Project	Source (give grant numbers)	Amount	Inclusive Dates
1. Experimental Bleomycin Pulmonary Toxicity	University of Texas Health Sciences Center Institutional Grant	\$5,000	1-1-76 -- 12-31-77

It is understood that the investigator and institutional officers in applying for a grant have read and accept the Council's "Statement of Policy Containing Conditions and Terms Under Which Project Grants Are Made."

Principal investigator

Typed Name Carlos W. M. Bedrossian, M.D.Signature *Carlos W. M. Bedrossian* Date 6-23-75Telephone REDACTED

Area Code Number Extension

Checks payable to

The University of Texas Health Science Center  
Houston (Medical School)

Mailing address for checks

P. O. Box 20036  
Houston, Texas - 77025

Responsible officer of institution

Typed Name G. C. FranklinTitle Vice President for Business AffairsSignature *G. C. Franklin* Date 7-1-75Telephone REDACTED

Area Code Number Extension

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# REFERENCES:

1. Foraker, A. G., Bedrossian, C.W.M., and Anderson, A.E. Jr.: Myocardial dimensions and proportions in pulmonary emphysema. Arch. Pathol. 90:344-347, 1970.
2. Anderson, A.E., Jr., Bedrossian, C.W.M. and Foraker, A.G.: Systemic blood pressure in subjects with and without emphysema. Amer. Rev. Resp. Dis. 103:576-578, 1971.
3. Bedrossian, C.W.M.: Coexistent emphysema and bronchogenic carcinoma. Cancer Bulletin 24:102-107, 1972.
4. Kueppers, F.: Alpha-1-antitrypsin: physiology, genetics and pathology. Human Genetics 6:207, 1968.
5. Laurell, C.B. and Eriksson, S.: The electrophoretic alpha-1 globulin pattern of serum in alpha-1-antitrypsin deficiency. Scand. J. Clin. Lab. Invest. 15:132, 1963.
6. Sharp, H.L., Bridges, R.A., Krivit, W. and Freier, E.F.: Cirrhosis associated with alpha-1-antitrypsin deficiency: A previously unrecognized inherited disorder. J. Lab. Clin. Med. 73:934-939, 1969.
7. Tarkoff, M.P., Kueppers, F. and Miller, W.F.: Pulmonary emphysema and alpha-1-antitrypsin deficiency. Amer. J. Med. 45:220-228, 1969.
8. Berg, N.O. and Eriksson, S.: Liver disease in adults with alpha-1-antitrypsin deficiency. New Engl. J. Med. 287:1,264-1,266, 1972.
9. Gherardi, G.J.: Alpha-1-antitrypsin deficiency and its effect on the liver. Human Pathol. 2:173-175, 1971.
10. Eriksson, S.: Studies in alpha-1-antitrypsin deficiency. Acta Med. Scand. 177, Suppl. 432, 1965.
11. Sharp, H. A.: Alpha-1-antitrypsin deficiency. Hosp. Pract. 83, 1971.
12. Greenberg, S.D., O'Neal, R.M. and Jenkins, D.E.: A rapid method of inflation-fixation for the morphologic study of chronic pulmonary disease. Amer. J. Clin. Path. 41:658-662, 1964.
13. American Thoracic Society: chronic bronchitis, asthma, and pulmonary emphysema: A statement by the Committee on Diagnostic Standards for nontuberculous respiratory diseases. Amer. Rev. Res. Dis. 85:762, 1962.
14. Rubin, E. and Popper, H.: The evolution of human cirrhosis as deduced from observations in experimental animals. Med. 46:163, 1967.

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## CURRICULUM VITAE

NAME: Carlos Wanes Menino Bedrossian

PLACE AND DATE OF BIRTH: REDACTED

SOCIAL SECURITY NUMBER: REDACTED

CITIZENSHIP: REDACTED

HOME ADDRESS: REDACTED

OFFICE ADDRESS: Department of Pathology University of Oklahoma  
Health Sciences Center, P.O. Box 26901  
Oklahoma City, Oklahoma 73190

MARITAL STATUS: REDACTED

CHILDREN: REDACTED

EDUCATION: R B.A. and B.S. Colegio Moura Lacerda, Ribeirao  
Preto, Sao Paulo, Brazil.  
R M.D., University of Sao Paulo, Ribeirao Preto  
Medical School, Ribeirao Preto, Sao Paulo, Brazil.

MILITARY SERVICE: Lieutenant, Medical Corps, Brazilian Air Force, 1968.

POST GRADUATE  
ACTIVITIES: 1968-1969, Chief of Laboratories, 4th Aerial Zone Hospital,  
Brazilian Air Force, Sao Paulo, Brazil, Volunteer Assistant,  
Departments of Pathology, Santa Casa, Paulista de  
Medicina and Juqueri Hospitals, Sao Paulo, Brazil.  
1969-1971, Resident in Pathology and Research Fellow in  
Pulmonary Pathology, Baptist Memorial Hospital,  
Jacksonville, Florida, U.S.A.  
1971-1972, Fellow in Anatomical Pathology, The University  
of Texas M.D. Anderson Hospital and Tumor Institute,  
Texas Medical Center, Houston, Texas, U.S.A.  
1972-1973, Fellow in Diagnostic Cytopathology and  
Pulmonary Pathology, Baylor College of Medicine,  
and Chief Resident in Pathology, Ben Taub General Hospital  
Texas Medical Center, Houston, Texas, U.S.A.

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## HOSPITAL APPOINTMENTS:

1973-1975: Assistant Pathologist and Director of Cytopathology, University Hospital, Veterans Administration Hospital, and Oklahoma Children's Memorial Hospital, The University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma.

1975-Present: Assistant Pathologist and Director of Cytopathology, Hermann Hospital, Texas Medical Center, Houston, Texas.

## ACADEMIC POSITIONS:

1973-1975: Assistant Professor of Pathology, Colleges of Medicine and Dentistry, The University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma

Associate Professor and Chairman, Department of Cyto-technology, College of Allied Health Professions, The University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma

1975-Present: Assistant Professor of Pathology, University of Texas Medical School at Houston, Texas Medical Center, Houston, Texas

## LICENSES AND CERTIFICATES:

1968 - Conselho Regional de Medicine, Sao Paulo, Brazil, License #13110

1970 - Educational Council for Foreign Medical Graduates, Certificate #099-654-6

1971 - State of Texas Board of Examiners in the Basic Sciences, Certificate #19391

1972 - Texas State Board of Medical Examiners, License #D-9356

1973 - Oklahoma State Board of Medical Examiners License #10019

1974 - American Board of Pathology, Board Certified in Anatomic and Clinical Pathology

## PROFESSIONAL ORGANIZATIONS:

REDACTED

REDACTED

## FIELDS OF SCIENTIFIC INTEREST:

Diagnostic Cytopathology  
Clinical-pathologic correlations in chronic obstructive pulmonary disease.  
Examination of excised lungs by pathological and radiological methods.  
Electron microscopy of cancer and other pulmonary diseases.  
Heart-Lung inter-actions in normal and in disease.

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HONORS AND AWARDS:

1966, Academic Merit Diploma, The University of Sao Paulo, Ribeirao Preto, Sao Paulo, Brazil.

1967, Best Student in the Basic Sciences Award, The University of Sao Paulo, Ribeirao Preto, Sao Paulo, Brazil.

1972, Annual Clinical Training Research Project Award, The University of Texas M.D. Anderson Hospital and Tumor Institute, Houston, Texas.

1974, "Who's Who in Texas", United States Public Relations Service, Atlanta, Georgia.

ELECTED OFFICE:

President, Oklahoma Society of Cytopathology. 1974-75.

POST GRADUATE STUDIES:

Pathology of the Lung. University of California, San Diego, La Jolla, California. Averyll A. Liebow, Director, June 23-28, 1969.

Gynecologic and Obstetric Pathology, Armed Forces Institute of Pathology, Washington, D.C., Henry J. Norris, Director, October 26-30, 1970.

Dermal Pathology. The University of Texas M. D. Anderson Hospital and Tumor Institute, Houston, Texas. J. Leslie Smith, Jr., Director, August 23-27, 1971.

Clinical Pathology of Respiratory Diseases. The Association of Clinical Scientists, Chicago, Illinois. William Sunderman, Director, November 3-5, 1972.

A Symposium on Diseases of the Chest, The Fleischner Society, Boston, Massachusetts, Leo G. Rigler, Director, May 26-29, 1973.

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PRESENTATIONS:

1. "Myocardial Dimensions and Proportions in Pulmonary Emphysema" to Florida Academy of Sciences, Jacksonville University, Jacksonville, Florida, March 5, 1970.
2. "Bronchitis Cronica y Enfisema Pulmonar" to the Mexican Patholgists Association, Sequros Sociales Hospital, Mexico City, Mexico, June 19, 1970.
3. "An Eclectic Approach to Lung Morphology" to the Brazilian Pathologists Association, Northeast Chapter, Recife, Pernamuco, Brazil, January 14, 1972.
4. "Interstitial Pneumonitis Associated with Bleomycin Therapy" to the International Academy of Pathology, Cincinnati, Ohio, March 15, 1972.
5. "Lung Cancer and Emphysema" to the Texas Chapter American College of Chest Physicians, San Antonio, Texas, May 13, 1972.
6. "Bleomycin Pulmonary Toxicity In Clinical and Experimental Subjects" to the Medical Research Division, Bristol Laboratories, Syracuse, N.Y., May 25, 1973.
7. "Ultrastructure of the Lung in Loeffler's Pneumonitis" to the Latin-American Pathologists Association, Merida, Yucatan, Mexico, November 27, 1973.
8. "The Lung in Cystic Fibrosis of the Pancreas" to the Latin-American Pathologists Association, Merida, Yucatan, Mexico, November 27, 1973.
9. "Electron Microscopic Changes and some Experimental Aspects of Bleomycin Pulmonary Toxicity" to the National Cancer Institute, Division of Cancer Treatment, NIH, Bethesda, Maryland, February 15, 1974.
10. "Esophageal Cytopathology: Review of Experience and Presentation of Interesting Cases" to the Texas Society of Cytology, Dallas, Texas, April 27, 1974.
11. "The Role of Cytopathology in the Diagnosis of Gastroesophageal Diseases" to the Oklahoma Society of Cytopathology, Oklahoma City, Oklahoma, May 15, 1974.
12. "Experimental Bleomycin Pulmonary Toxicity" to the Brazilian Society of Pathology, Curitiba, Parana, Brazil, September 4, 1974.

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PRESENTATIONS:  
(continued)

13. "Ultrastructure of Human Bronchiolo-alveolar Carcinoma" to the Brazilian Society of Pathology, Curitiba, Parana, Brazil, September 7, 1974.
14. "Pitfalls in Diagnosing, Cell Typing and Judging Degree of Differentiation of Bronchogenic Carcinoma in Brush Cytology Specimens" to the American Society of Cytology, New York, New York, November 8, 1974.

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# PUBLICATIONS

- 1970: 1. Bohm, G.M., Bedrossian, C.W.M., De Luca, F. and Kerr, W.: The failure of nucleic acids to prevent the destruction of neurons in Chagas disease. *Rev. Lat. Amer. Pathol.* 9:17-23 (Mexico).
2. Foraker, A.D., Bedrossian, C.W.M., and Anderson, A.E.: Myocardial dimensions and proportions in pulmonary emphysema. *Arch. Pathol.* 90:344-347.
- 1971: 3. Anderson, A.E., Bedrossian, C.W.M., and Foraker, A.G.: Systemic blood pressure in subjects with and without emphysema. *Amer. Rev. Resp. Dis.* 103:576-578.
4. Bedrossian, C.W.M., Anderson, A.E. and Foraker, A.G.: Comparison of methods for quantitating bronchial morphology. *Thorax* 24:406-408, (London).
- 1972: 5. Luna, M.A., Bedrossian, C.W.M., Lichtiger, B. and Salem, P.: Interstitial pneumonitis associated with Bleomycin therapy. *Amer. J. Clin. Pathol.* 58:501-510.
6. Bedrossian, C.W.M.: Coexistent emphysema and bronchogenic carcinoma. *Cancer Bulletin* 24:102-107.
- 1973: 7. Bedrossian, C.W.M. and Martin, J.E.: Xeroradiography of the lung. *Radiol.* 107:217-218.
8. Bedrossian, C.W.M., Greenberg, S.D. and Duran, B.S.: Bronchial gland measurements: A continuing search for a yardstick. *J. Exp. & Molec. Pathol.* 18:219-224,
9. Bedrossian, C.W.M., Luna, M.D., MacKay, B. and Lichtiger, B.: Ultrastructure of pulmonary Bleomycin toxicity, *Cancer* 32:44-51.
10. Wurlitzer, F., Bedrossian, C.W.M., Ayala, A.G. and McBride, C.: Problems in diagnosing and treating infiltrating lipomas. *Amer. Surg.* 39:240-243.
- 1974: 11. Stork, W.J., Greenberg, S.D. and Bedrossian, C.W.M.: Fatal sarcoidosis. VI Int. Conf. on Sarcoidoses, Tokio, Japan. pp 462-472, Univ. Park Press.
12. Bedrossian, C.W.M. Ultrastructural changes and some experimental aspects of Bleomycin pulmonary toxicity. In "New Drug Seminar" sponsored by National Cancer Institute, Division of Cancer Treatment, Bethesda, Md., p. 169, Feb.
13. Bedrossian, C.W.M.: Current data regarding Bleomycin-induced pulmonary toxicity: An Audio Review. *Intramed. Communications.* In New York, N.Y., Vol. 2, Side 2, April.
- 1975: 14. Bedrossian, C.W.M., Greenberg, S.D., and Williams, L.J.: Ultrastructure of the lung in Loeffler's pneumonitis. *Amer. J. Med.*, 58:438-443.
15. Bedrossian, C.W.M., Greenberg, S.D., Singer, D., Jensen, J., and Rosenberg, H.: The lung in cystic fibrosis of the pancreas. *Human Pathology* (In press).

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1975  
continued

16. Weillbaecher, D.G., Bedrossian, C.W.M., Greenberg, S.D. and Bentick, D.C.: Ultrastructure of human bronchioloalveolar carcinoma. Cancer (In press).
17. Bedrossian, C.W.M. and Rybka, D. L.: Bronchial brushing during fiberoptic bronchoscopy for the cytodiagnosis of lung cancer. Comparison with sputum and bronchial washings. Acta Cytologica. (Submitted for publication).
18. Bedrossian, C.W.M., Yawn, D.H., Greenberg, S.D. and O'Neal, R.M.: Experimentally-induced Bleomycin pulmonary toxicity in the pheasant - Part I: Histopathological findings. Lab. Invest. (Submitted for publication).
19. Bedrossian, C.W.M., Greenberg, S.D., Yawn, D.H. and O'Neal, R.M.: Experimentally-induced Bleomycin pulmonary toxicity in the pheasant - Part II: Ultrastructural observations. Lab. Invest. (Submitted for publication).

1975  
Work in  
Progress

1. Bedrossian, C.W.M., Greenberg, S.D., Luna, M.A., Skinner, F.M. and Jenkins, D. E.: Pathological patterns of chronic obstructive pulmonary disease associated with "environmental" and "endogenous" lung cancer. (In preparation).

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Date: November 5, 1974

## CURRICULUM VITAE

A. Personal Information:Name in Full  
Business AddressDonald Charles Cannon  
University of Texas Medical School-Houston  
6400 W. Cullen Blvd.  
Houston, Texas 77025  
(713) 792-4701Business Phone  
Home AddressHome Phone  
Date of Birth  
Place of Birth  
Citizenship  
Marital Status  
Spouse's First Name  
Number of Children  
Social Security Number

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B. EducationHigh School  
College or University  
Medical SchoolWilliam Chrisman High School, Independence,  
Missouri, R  
Harvard College, Cambridge, A.B. R  
University of Chicago, Ph.D., R  
Washington University School of Medicine,  
St. Louis, R  
University of Chicago Medical School,  
M.D., R  
UCLA Hospital, 1960-61, Pathology  
University of Chicago Clinics,  
July 1961-June, 1964-Pathology  
Summer Fellow in Pathology, 1958,  
Washington University  
U.S.P.H.S. Pre-doctoral Trainee, 1960,  
University of Chicago, Immunopathology  
U.S.P.H.S. Post-doctoral Trainee, 1961-  
1963, University of Chicago, Immunopathology  
Harvard College Scholarship, 1952-56  
Phi Beta Kappa, Harvard College, 1956  
Jackson Johnson National Scholarship,  
Washington University, 1956-1958  
President, first year medical class,  
Washington UniversityInternship  
Residencies

Fellowships

Honors and Awards

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Honors and Awards

Chicago University Scholarship, 1959-1960  
Alpha Omega Alpha, University of Chicago  
Sigma Xi, University of Chicago  
Markle Scholar in Academic Medicine,  
1967-1968  
Award of Merit for Distinguished Service in  
Advancing the Cause of Blood Banking,  
American Association of Blood Banks, 1967  
Missouri, 1962 (certificate 28946)  
New York, 1965 (certificate 95632)  
California, 1970 (certificate C-32725)  
American Board of Pathology (clinical and  
anatomic), 1967

Licensure

Board Certification

C. Professional Background:

Academic Appointments

Instructor of Pathology, University of Chicago, 1963-64  
Instructor of Clinical Bacteriology and Pathology, University of  
North Carolina, 1964-65  
Assistant Professor of Pathology, Upstate Medical Center, 1965-68  
Associate Professor (in absentia), Upstate Medical Center, 1969  
Visiting Professor of Pathology, The University of New Mexico,  
1972-present  
Associate Clinical Professor of Pathology, University of Southern  
California, 1973-present

Specific teaching responsibilities

Autopsy case study for sophomores, 1960-61  
Teaching in general histopathology for sophomores, 1961-62  
Lectures in liver pathology for sophomores and in endocrine pathology  
for seniors, 1963-64  
Lectures in general pathology and autopsy case study for sophomores.  
Lectures and laboratory training in clinical bacteriology, autopsy  
and surgical pathology training for pathology resident physicians,  
1964-65  
Lectures in immunology, blood banking, and clinical chemistry;  
conference leader in general pathology and clinical pathology; and  
gross autopsy review for sophomores. Lectures to medical  
technology students and blood bank technology students. Clinical  
pathology training of pathology resident physicians. 1965-68.

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Specific teaching responsibilities

Teaching in blood banking and immunology, Foundation for Advanced Education in the Sciences, National Institutes of Health, 1968-69  
Director of Resident Training, Clinical Pathology Department, NIH, 1969-70  
Lectures and conference teaching in acid-base and electrolytes for sophomores, 1972-74

Specific administrative responsibilities

Assistant Director and Assistant Attending Pathologist, Division of Clinical Pathology, Upstate Medical Center, 1965-68  
Hospital Emergency Room - Outpatient Committee, 1965-68  
Hospital Safety Committee, 1965-68; Chairman, 1967-68  
Syracuse Red Cross Blood Program Committee, 1966-68  
Hospital Disaster Planning Committee, 1967-68  
House Officers and Graduate Students Committee, 1967-68  
Syracuse Red Cross Blood Recruitment Committee, 1967-68  
Medical Occupations Advisory Committee, Manpower Development Training Program, 1967-68; Chairman, Subcommittee on Laboratory Training  
Cancer Subcommittee, Onondaga County Medical Society, 1967-68  
Blood Bank Inspector, Northeast District, American Association of Blood Banks, 1967-68  
General Director and Coordinator, American Association of Blood Banks Pre-convention Workshop on Blood Component Therapy, 10/21/67  
Workshop Committee, American Association of Blood Banks, 1967-68  
Member, Medical Technology Workshops Committee, American Society of Clinical Pathologists, 1969-71  
Member, Ad Hoc Review Committee for Advanced Traineeships, Division of Allied Health Manpower, NIH, 1969  
Panel Member, Interagency Board of U. S. Civil Service Examiners for Washington, D. C., 1969-70

Military service

U. S. Public Health Service, 1968-70

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Curriculum Vitae

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Donald Charles Cannon, M.D., Ph.D.

Other employment or activity

Chief, Diagnostic Reagents Section, Laboratory of Blood and Blood Products, Division of Biologics Standards, National Institutes of Health, July - December, 1968  
Clinical Pathologist, Clinical Chemistry Service, Clinical Pathology Department, Clinical Center, NIH, January - June, 1969  
Assistant Section Chief, Clinical Chemistry Service, Clinical Pathology Department, Clinical Center, NIH, July 1969 - June, 1970  
Assistant Director (1970 - 71), Director (1971 - 74), Bio-Science Laboratories, Van Nuys, California  
Professor and Director, Program in Pathology, University of Texas Medical School at Houston, Houston, Texas (1974 - Present)

D. Society Memberships:

National

REDACTED

E. Consultantships:

None

F. Research Activities:

Complete Bibliography

Appended.

Major Areas of Research Interest

Clinical chemistry, especially correlation of clinical laboratory tests with diagnosis.

Research in Progress

Correlation of serum triiodothyronine assays with thyroid status.

Research grants in Past Five Years

None

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BIBLIOGRAPHY

1. Cannon, D.C., and R. W. Wissler. Migration of Spleen Cells into the Blood Stream Following Antigen Stimulation of the Rat. *Nature* 207:654, 1965.
2. Ward, P.H., Cannon, D.C., and J.R. Lindsay. The Vestibular System in Multiple Sclerosis. A Clinical Histopathological Study. *Laryngoscope* 75:1031, 1965.
3. Cannon, D.C., and R.W. Wissler. Restoration of the Immune Response by Circulating Lymphocytes. *Arch. Path.* 83:188, 1967.
4. Cannon, D.C., and R.W. Wissler. Spleen Cell Migration in the Immune Response of the Rat. *Arch. Path.* 84:109, 1967.
5. Cannon, D.C., Immunoglobulin Analysis in Clinical Diagnosis. I. Quantitative Methods. *Postgrad. Med.* 46(2):55, 1969.
6. Cannon, D.C., Immunoglobulin Analysis in Clinical Diagnosis. II. Immunoelectrophoresis. *Postgrad. Med.* 46(3):55, 1969.
7. Cannon, D.C. Clinical Aspects of the Leukocyte Antibody Reaction. *Postgrad. Med.* 47:51, 1970.
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9. Reed, A.H., Cannon, D.C., Pileggi, V.J., and J.W. Winkelman. Use of confidence intervals to assess precision of normal range estimates. *Clin. Biochem.* 6:29, 1973.
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